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Silicon mediates sodium transport and partitioning in maize under moderate salt stress

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Highlights

- Silicon up-regulates expression of maize *ZmSOS1* Na⁺ exporter genes in root tissues
- Silicon increases leaf accumulation of Na⁺ due to enhanced xylem loading of Na⁺
- Silicon enhances sequestration of Na⁺ into the vacuoles of leaf mesophyll cells
- Silicon shifts maize response to salinity towards that typical for halophytes

Abstract

Silicon (Si) is known to alleviate salt stress in various crops; however, the influence of Si on sodium (Na) transport and partitioning at the tissue, cell and organelle levels is poorly understood. Maize (*Zea mays* L.) hybrid sensitive to salt stress was exposed to moderate salt stress (40 mM NaCl; simulating conditions in salinized agricultural soils) without or with supply of 1.5 mM Si(OH)₄. We investigated the expression of *SOS* genes encoding Na⁺ efflux transporter in various root tissues of maize, paralleled by measurements of tissue Na

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